5. Start with the area, and one side length.

a) $9c^2 \div 3c = 3c$

b) $(m^2 + 3m) \div m = m + 3$

c) $(2r^2 + 4r) \div 2r = r + 2$

8. a) $(6x^2 + 3x) \div (3x) = 2x + 1$

b) $(8x^2 + 28x) \div (4x) = 2x + 7$

11. a) $(2r)(-6r) = -12r^2$

b) $(-16n^2) \div (-8n) = \frac{(-16)}{(-8)} \times \frac{n^2}{n}$

$= 2n$

c) $(-5g)(7g) = -35g^2$

d) $\frac{40k}{-10k} = \frac{40}{(-10)} \times \frac{k}{k}$

$= -4$

e) $(9h)(3h) = 27h^2$

f) $\frac{48p^2}{12p} = \frac{48}{12} \times \frac{p^2}{p}$

$= 4p$

g) $18u^2 \div (-3u^2) = \frac{18}{(-3)} \times \frac{u^2}{u^2}$

$= -6$

h) $\frac{-24d^2}{-8d^2} = \frac{(-24)}{(-8)} \times \frac{d^2}{d^2}$

$= 3$

16. I expressed each quotient expression as the sum of fractions, then simplified.

a) $\frac{10x^2 + 4x}{2x} = \frac{10x^2}{2x} + \frac{4x}{2x}$

$= 5x + 2$

b) $(6x^2 + 4x) \div x = \frac{6x^2 + 4x}{x}$

$= \frac{6x^2}{x} + \frac{4x}{x}$

$= 6x + 4$

c) $\frac{6y + 3y^2}{3y} = \frac{6y}{3y} + \frac{3y^2}{3y}$

$= 2 + y$

d) $\frac{40x^2 - 16x}{8x} = \frac{40x^2}{8x} + \frac{-16x}{8x}$
$= 5x - 2$

e) $\frac{15g - 10g^2}{5g} = \frac{15g}{5g} + \frac{-10g^2}{5g}$
$= 3 - 2g$

f) $\frac{-12k - 24k^2}{3k} = \frac{-12k}{3k} + \frac{-24k^2}{3k}$
$= -4 - 8k$

g) $(24h^2 + 36h) \div (-4h) = \frac{24h^2 + 36h}{-4h}$
$= \frac{24h^2}{-4h} + \frac{36h}{-4h}$
$= -6h - 9$

h) $(-8m^2 + 18m) \div (-2m) = \frac{-8m^2 + 18m}{-2m}$
$= \frac{-8m^2}{-2m} + \frac{18m}{-2m}$
$= 4m - 9$

19. a) The area of a rectangle is length × width.
Area of large rectangle: $(3s^2 + 2)(2s) = 3s^2(2s) + 2(2s)$
$= 6s^2 + 4s$
Area of small rectangle: $(s + 1)(2s) = s(2s) + 1(2s)$
$= 2s^2 + 2s$

b) To determine the area of the shaded region, subtract the area of the smaller rectangle from the area of the larger rectangle.
$(6s^2 + 4s) - (2s^2 + 2s) = 6s^2 + 4s - 2s^2 - 2s$
$= 6s^2 - 2s^2 + 4s - 2s$
$= 4s^2 + 2s$

c) Substitute $s = 2.5$ in $4s^2 + 2s$.
$4(2.5)^2 + 2(2.5) = 25 + 5$
$= 30$
The area is 30 cm^2.

21. I wrote each quotient expression as the sum of fractions, then simplified.

a) $(12x^2 + 6xy) \div 3x = \frac{12x^2 + 6xy}{3x}$
$= \frac{12x^2}{3x} + \frac{6xy}{3x}$
$= 4x + 2y$

b) $\frac{12gh + 6g}{2g} = \frac{12gh}{2g} + \frac{6g}{2g}$

$= 6h + 3$

c) $(-27p^2 + 36pq) \div 9p = \frac{-27p^2 + 36pq}{9p}$

$= \frac{-27p^2}{9p} + \frac{36pq}{9p}$

$= -3p + 4q$

d) $\frac{40rs - 35r}{-5r} = \frac{40rs}{-5r} + \frac{-35r}{-5r}$

$= -8s + 7$

e) $\frac{14n^2 + 42np}{-7n} = \frac{14n^2}{-7n} + \frac{42np}{-7n}$

$= -2n - 6p$

23. a) A cube has 6 congruent faces. Its surface area is 6 times the area of one face. So, to find the area of a face, I divide the surface area by 6:

$54s^2 \div 6 = 9s^2$

The area of one face is $9s^2$.

b) To find the edge length, I think multiplication.

$\square \times \square = 9s^2$

Since $s \times s = s^2$ and $3 \times 3 = 9$, then $3s \times 3s = 9s^2$

So, the edge length of an edge is $3s$